REMARKS

Reconsideration of the above-identified application in view of the amendments above and the remarks following is respectfully requested.

The office action of January 12, 2007 acted upon claims 1-15. Claims 1-15 were rejected under 35 USC, section 103 (a). By this response, claims 1-15 have been canceled without prejudice, and new claims 16-31 have been presented in the belief that they recite allowable subject matter.

§ 103 Rejections

The Examiner has rejected claims 1-4, 7-12, and 14 under § 103(a) as being unpatentable over U.S. Patent No. 2,530,524 to Hlavin (henceforth, "Hlavin") in view of U.S. Patent No. 6,346,197 to Stephenson (henceforth, "Stephenson") or U.S. Patent Publication No. 2004/0251213 to Bradley (henceforth, "Bradley"). Claims 5-6, 13 and 15 are rejected claims under § 103(a) as being unpatentable over the above, further in view of U.S. Patent No. 6,800,207 to Holt et al. (henceforth, "Holt"). The Examiner's rejections are respectfully traversed.

Independent claims 1, 9, and 14 all recite a structural limitation of an electrochemical cell having a metallic tank for receiving an effluent from said storage tank, said metallic tank forming a cathode of said electrochemical cell. This fundamental feature is not taught, nor fairly suggested, by Hlavin, nor by the other cited prior art. In fact, Hlavin expressly teaches a graphite electrode and a Monel electrode, and that the tank may be maintained at ground potential.

Hlavin does not teach, nor fairly suggest, an electrochemical stage in which bacteria are precipitated on the cathodic walls of the tank, and in which bacteria are eradicated by the extreme conditions therein, such as high pH values -- typically 12-14 – in the vicinity of the tank walls.

The cathode of Hlavin has an extremely small surface area, as opposed to the instant invention, in which the entire inner surface area of the tank is cathodic. This difference is not merely a matter of arbitrary design: sizable surface area is required for effective treatment of the microorganisms in the water supply, as will be elaborated further hereinbelow.

It is well known in the art that when scale inhibition is effected by deliberate scale precipitation and removal, only a small fraction of the ions forming the scale needs to be precipitated. By way of example: in water containing 200 ppm calcium carbonate, the precipitation of 5 to 15 percent (10-30 ppm) of the calcium carbonate is generally more than sufficient to ensure that no formation of scale ensues.

By sharp contrast, in treating water containing microorganisms such as Legionella Pneumophila, a trap and kill rate of well over 90% is required in order for the treatment to be considered successful.

In the art disclosed by Hlavin, only a small portion of the feedwater passes between the Monel and graphite electrodes. A substantial portion of the water passes through the pipe, around the electrochemical cell, and into the tank containing the treated water. While this configuration, by removing a small portion of the overall concentration of calcium and carbonate ions, may be efficient in inhibiting scale, such a configuration appears fundamentally unsuitable to trapping and/or eradicating microorganisms.

Although Bradley and Stephenson teach that bacteria can be trapped using coagulating materials, a significant portion of such coagulated microorganisms would not be removed by the device of Hlavin, just as the device of Hlavin does not remove a significant portion of the scale-forming ions, as articulated hereinabove. Thus, the modification of Hlavin with the teachings of Bradley or Stephenson, as suggested by the Examiner, would not result in an effective treatment of the microorganisms in the water supply.

In summarizing the known art as of April 2, 2004, Bradley discloses that

> Electrocoagulation has been used in water treatment, particularly wastewater treatment for many years, and the processes involved are well known to those skilled in the art. An electrical potential is applied between a cathode and an anode positioned so as to create an electric field in the water stream, the water and dissolved substances therein being an electrolyte. If at least one of the cathode and anode is sacrificial, ions therefrom migrate into the electrolyte and bond with impurities to create precipitates, which can be physically removed from the water stream by means such as floatation, sedimentation and filtering. Moreover, disassociation of water molecules forms oxygen in multiple forms, hydrogen and hydroxyls, which several species can also be involved in beneficial reactions, e.g. oxidation-reduction reactions, and can also interact with biologics, if present, with treatment effect. Moreover, microbubbles formed can physically interact with suspended materials and forming precipitates to aid in removal by floatation or aggregation. (paragraph [0003])

Thus, in the electrocoagulation treatment processes of Bradley, the coagulated species are physically removed from the water stream by means such as floatation, sedimentation and filtering; microbubbles formed can physically interact with suspended materials and forming precipitates to aid in removal by floatation or aggregation.

Neither Bradley nor Stephenson teaches, nor fairly suggests, that the efficacy of known electrocoagulation treatment process can be greatly enhanced by a second

electrochemical stage in which bacteria are precipitated on the cathodic walls of the tank, and in which bacteria are eradicated by the extreme conditions therein, such as high pH values -- typically 12-14 -- in the vicinity of the tank walls.

Moreover, in transferring coagulated species from the first tank into the second electrochemical tank, and in the turbulence caused by various gases liberated in the second tank, it might be expected that such coagulated species would break up or otherwise deteriorate, thereby compromising the electrocoagulation process.

Surprisingly, the instant inventor has discovered that the electrocoagulation process is not compromised by the various hydrodynamic, chemical, and electrical effects associated with the transfer of coagulated species from the first tank into the second electrochemical tank, and from the subsequent electrochemical process effected in the second tank.

Surprisingly, the instant inventor has discovered that it is highly advantageous to perform the process in two discrete and different electrochemical steps, in which electrocoagulation is performed in a first stage, and scale precipitation and bacteria eradication are performed in a second stage.

Moreover, unlike the teachings of Hlavin, the original independent claims recite the use of the metal tank as a cathode, such that an electrical field is formed over the entire radius of the tank, a feature that ensures that substantially all of the coagulated particles are drawn by the field so as to be deposited on the tank walls.

Thus, Applicant respectfully submits that the original claims are patentably distinct from the combined teachings of the cited prior art.

Nonetheless, claims 1-15 have been canceled without prejudice, and new claims 16-31 have been presented in the belief that they more clearly recite allowable subject matter.

Additional inventive features of the instant invention include:

- substantial eradication of the bacteria, including Legionella Pneumophila, which is known to be an extremely hardy bacteria (see, inter alia, page 6);
- the use of a non-sacrificial electrodes (see paragraph beginning at the bottom of page 6) in treating the coagulated particles; Bradley (quoted hereinabove) discloses solely sacrificial electrodes;
- adapting and operating the first electrochemical cell so as to produce a zone having a mildly alkaline pH, typically between about 9.5 to 10 (see page 6); consequently, the first cell has optimal conditions for electrocoagulation, and the second cell is adapted for eradication of the bacteria and collection on the walls of the tank.

Support for new claims 16-31 can be found in the specification. These claims are largely based on the original claims. Support for new limitations has been provided hereinabove.

In view of the above amendments and remarks it is respectfully submitted that claims 16-31 are in condition for allowance. Prompt notice of allowance is respectfully and earnestly solicited.

Respectfully submitted,

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